3D Imaging Dome In-air Demonstrator

3D Print Options from Stratasys

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SLAC MAGIS Group Meeting

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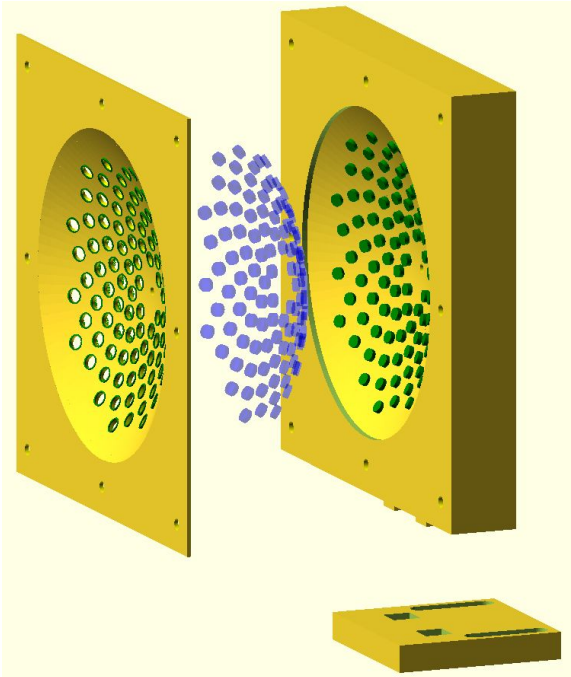
U.S. DEPARTMENT OF ENERGY
Office of Science

SLAC NATIONAL ACCELERATOR LABORATORY

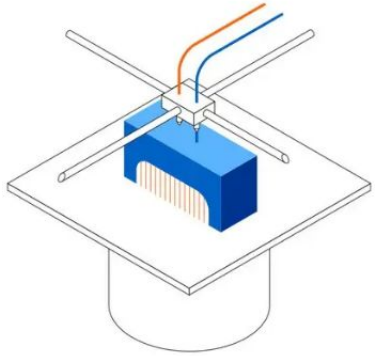
3D Print Quote from Stratasys

- Aug. 20th: first submission of preliminary CAD designs
- Aug. 25th: initial quote received from Stratsys
  - Two options recommended
  - **Fused Deposition Modeling (FDM)**
    - ASA Black: UV-stable, standard thermoplastic
  - **Laser Sintering (LS)**
    - Nylon 12 CF: Carbon-fiber-filled Nylon 12
- Aug. 26th: some additional questions / requests
  - Asked few questions and additional quote
  - Price independent of build orientation
  - **Stereolithography (SLA)**
    - Somos Watershed XC 11122

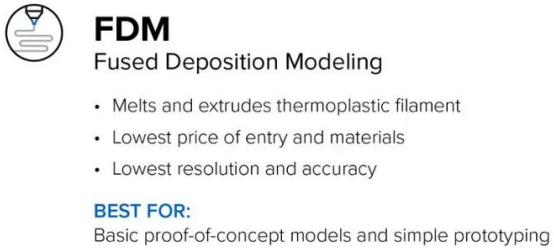


3D Print: Fused Deposition Modeling (FDM)

- Deposits molten thermoplastic filament
  - Most basic, standard 3D printing technology
- Recommended material: ASA Black
  - UV-stable, standard thermoplastic
- Resolution of 0.007” (178µm)
- “FDM is great at maintaining a cheaper value with denser parts”



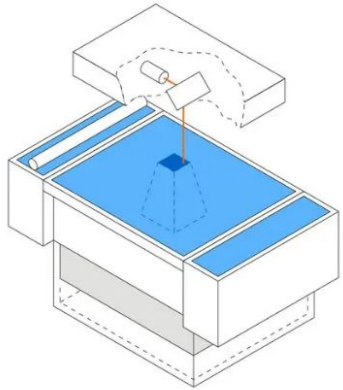
	Base	Front Board	LS Board	Object Rod	Total
FDM	$87	$171	$540	$48	$846



3D Print: Laser Sintering (LS)

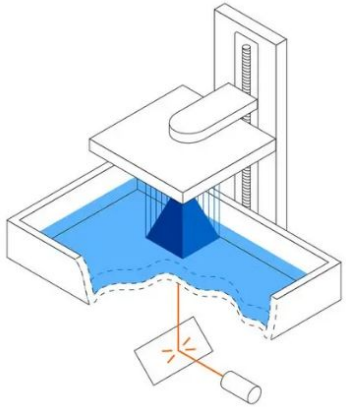
- Fuses polymer powder with laser
  - Tends to be low cost with decent resolution
- Recommended material: Nylon 12 CF
  - High stiffness, high tensile strength
  - Optimal reproduction of details
- Resolution of 0.004 - 0.006” (102 - 152µm)
- “SLS is better with parts that are more organic and cannot be manufactured otherwise”

	Base	Front Board	LS Board	Object Rod	Total
LS	$69	$252	$331	$45	$697

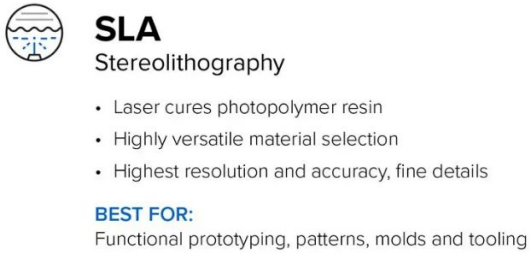


3D Print: Stereolithography (SLA)

- Laser cures photopolymer resin
  - Usually known as highest resolution/accuracy
- Recommended material: Somos Watershed XC 11122
  - Known for moisture resistance
  - Usually popular for parts where fluid flow is important
- Resolution: ??? (haven't heard back yet)



	Base	Front Board	LS Board	Object Rod	Total
SLA	$115	$126	$599	$82	$922



Stratasys Quote Summary

- Quotes for three different 3D printing technologies
  - Fused Deposition Modeling (FDM)
  - Laser Sintering (LS)
  - Stereolithography (SLA)
- LS or SLA seem to be the best, but we should get a resolution quote for the SLA option
- Should we print our in-air demonstrator with Stratasys?
- Should we prototype with smaller piece?
- How does these prices compare with ART (SLA)?

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